TECHNICAL SCHEDULE XI

FUNCTIONAL GUARANTEES OF THE PLANT
(To be completed by the Tenderer)

1.0 General

This document sets out the functional guarantees required to be provided by the Bidder for assessing the performance of the Works. These guarantees shall be used by the Employer to evaluate Bidder's satisfactory performance during the Tests after Completion, and also throughout the Operation and Maintenance Period.

The Bidder shall complete the following sections and provide values for the electrical energy usage for the Works covered under the contract, based on the raw sewage flows and characteristics and effluent and sludge quality requirements as given in Volume 2 (Employer's Requirements).

2.0 Functional Guarantees

2.1. Effluent and Sludge Quality

The Bidder guarantees that the effluent and sludge quality requirements specified in Volume 2 will be fully and completely met, under either actual or simulated design raw sewage flows, loadings, and characteristics, as demonstrated by the Tests after Completion. The bidder further guarantees that the specified requirements will continue to be fully and completely met throughout the Operation and Maintenance Period.

2.2. Electrical Energy Usage

The Bidder guarantees that electrical energy usage of various components of the STP including TSPS Works will not exceed the values listed in the table below, as demonstrated by the Tests after Completion and throughout the Operation and Maintenance Period. The actual electrical energy usage shall be directly metered and compared to guaranteed numbers on a monthly basis.

S.No	Item	Guaranteed not-to-exceed energy usage (PC_D) (kWh per Month)
1	100MLD STP at Mailsandra Complete Works	

Note:

1) Electrical Load List shall be provided for entire plant for each location to arrive guaranteed power consumption, considering the minimum equipment requirements as per tender specifications.
2) In case the Bidder fails to consider any of the above said factors, the

S.No	Item	Guaranteed not-to-exceed energy usage (PC_D) (kWh per Month)
	Employer has the sole authority to do necessary corrections and consider revised figures for NPV Calculation during Evaluation of the Bid.	
3)	The Bidder shall indicate the no. of units (KWH) of electrical energy consumption required for guaranteed performance of the Sewage Treatment Plant and Pumping Station (Volume 2A and Volume 2B, Section 7, Schedule XI) for full throughput of the rates quoted.	

2.3. Energy Consumption during Operation and Maintenance Period for STP

Energy Consumption during Operation and Maintenance Period for STP works during operation and maintenance period, the below formula will be applied for arriving the guaranteed power consumption based on actual flow and actual inlet sewage characteristics.

Symbol Definitions:

The following symbol definitions shall apply for the subsequent clauses of this schedule

PC_D = Guaranteed power consumption under design conditions for complete works of each plant, (kWh per day)

PC_A = Guaranteed not-to-exceed power usage under actual daily operating conditions for complete works of each plant, (kWh per day)

Q_D = Design average influent sewage flow for each plant (MLD)

Q_A = Daily actual metered influent sewage flow for each plant (MLD)

B_D = Design average influent sewage BOD concentration specified in bid document (mg/L)

B_A = Daily average of actual measured influent sewage BOD concentrations (mg/L)

N_D = Design average influent sewage TKN concentration specified in bid document (mg/L)

N_A = Daily average of actual measured influent sewage TKN concentrations (mg/L)

T_D = Design average influent sewage TSS concentration specified in bid document (mg/L)

T_A = Daily average of actual measured influent sewage TSS concentrations (mg/L)

Guaranteed not-to-exceed power consumption under actual daily operating conditions for complete works at each plant location shall be calculated per formula below and result value shall be Maximum of

$PC_A = [0.4*PC_D]$

Or

$PC_A = [\{PC_D*(Q_A/Q_D)\} *\{(0.55*B_A/B_D) +(0.22*N_A/N_D) +(0.23*T_A/T_D)\}]$

During operation and maintenance following table will be used for checking the guaranteed power consumption on actual monthly basis at each plant location

S.No	**Location**	**Day 1**	**Day 2**	**…….**	**……..**	**Day 30**	**Day 31**	**Total ΣPC_A**
1	100MLD STP at Mailsandra Complete Works							

Note:

1) Power consumption reading in a month during O&M period should be less than or equal to ΣPC_A for complete works of each plant location.